

# Sustainable Urban Forest Management Planning Using Criteria and Indicators

W. Andrew Kenny – University of Toronto, Philip van Wassenauer and Alexander Satel – Urban Forest Innovations Inc. MillionTreesNYC, Green Infrastructure and Urban Ecology: A Research Symposium, March 5-6, 2010

## Introduction

Urban forestry incorporates a variety of approaches:

- Ecosystem-based management
- Sustainability
- Outcome-based evaluation
- Performance-based management
- Strategic planning

**How can all of these principles be incorporated into a directed and implementable urban forest management strategy?**

## Vegetation Resource

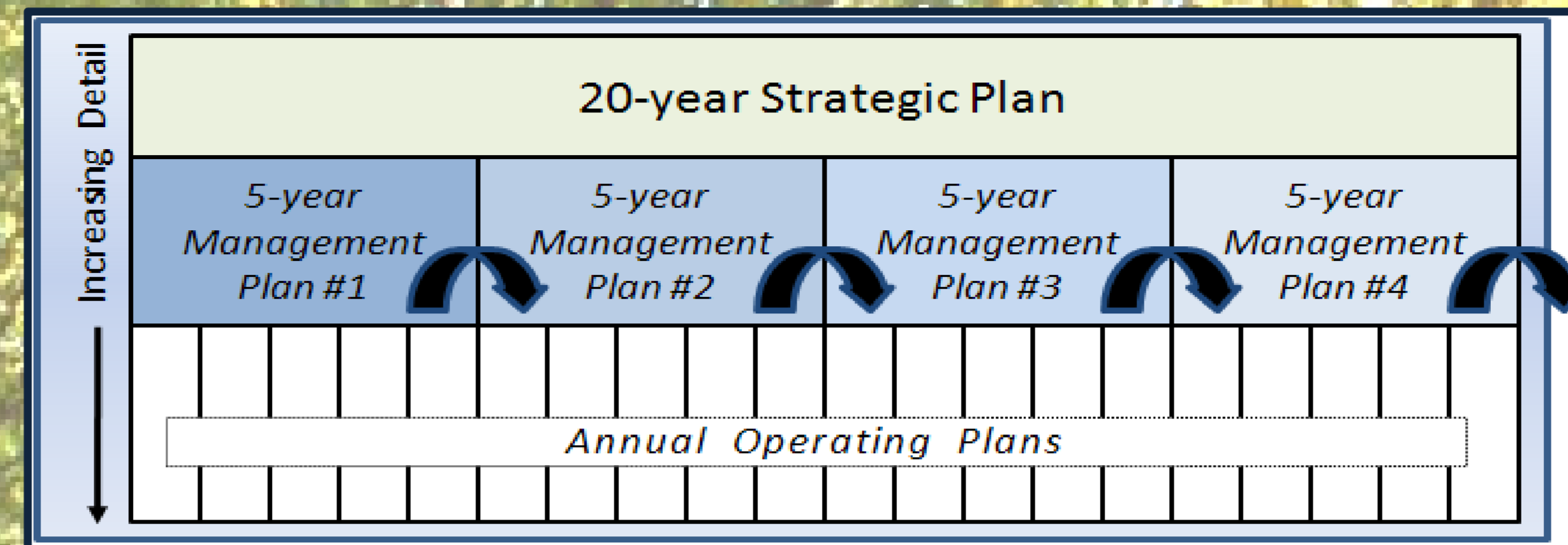
“The engine that drives urban forests”. Sustainable vegetation resource provides continuous, high level of benefits across the community.

## Community Framework

“All parts of the community share a vision for their forest and act to realize it.” The community acts to maximize urban forest benefits.

## Resource Management Approach

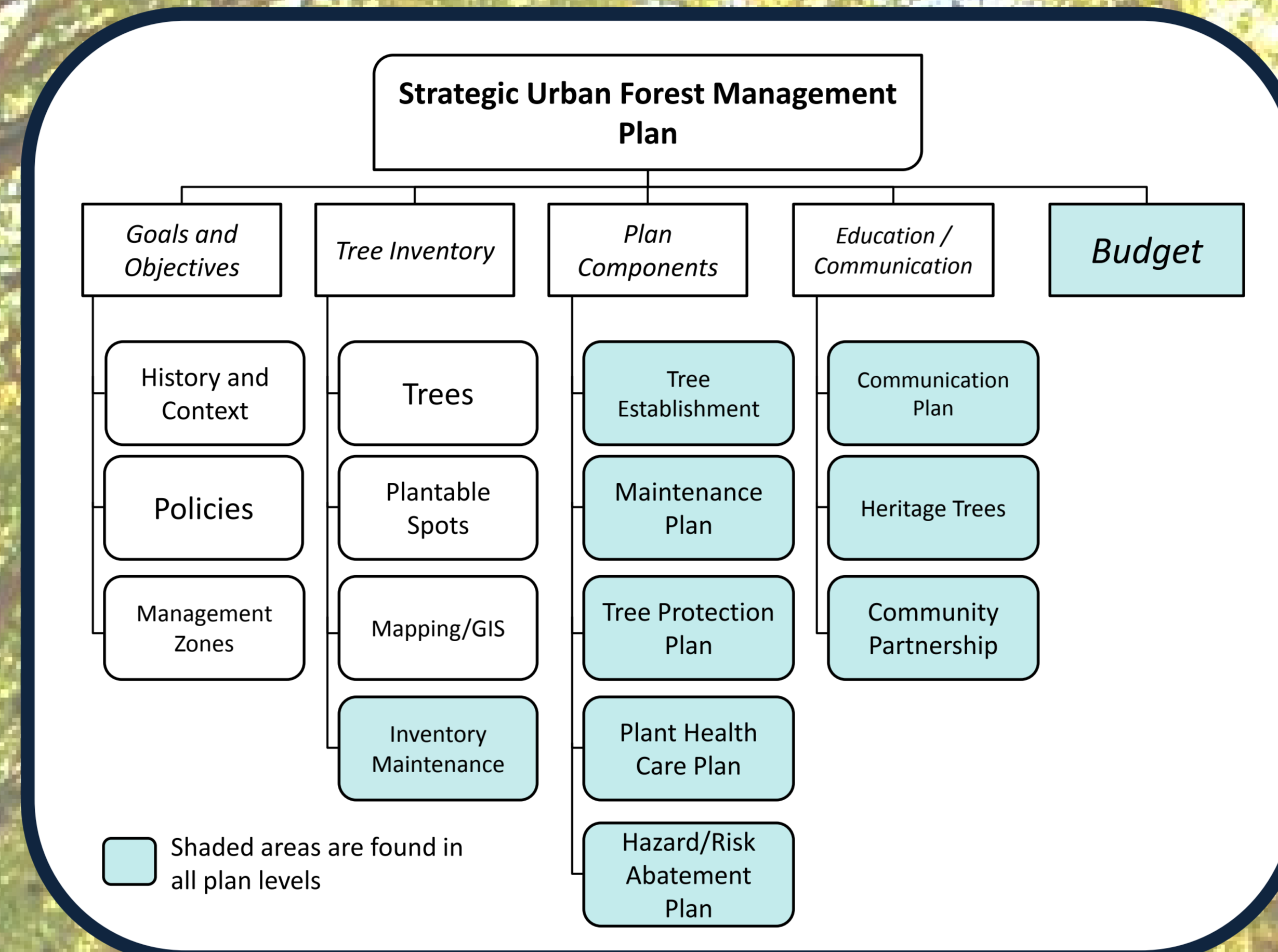
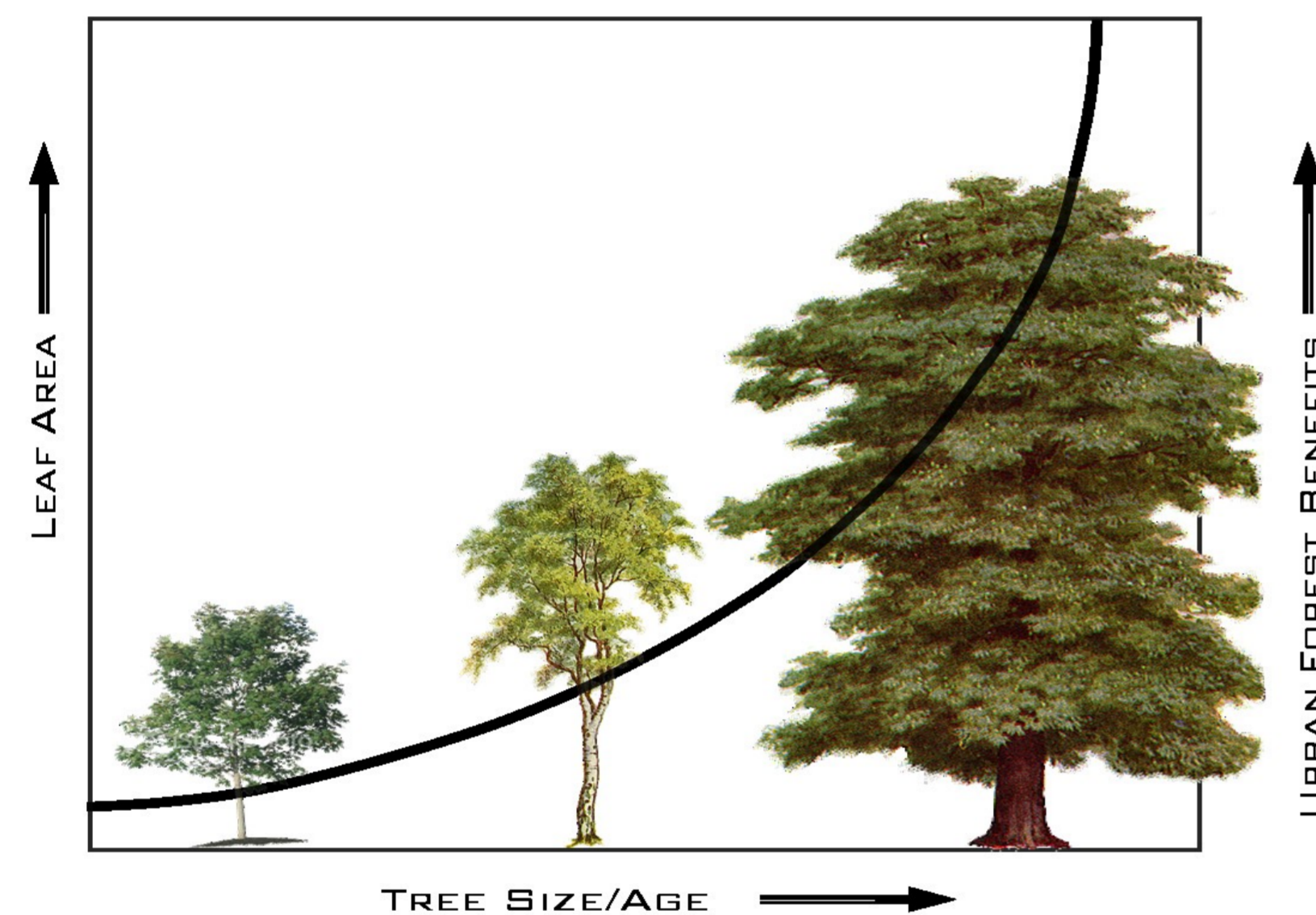
“The philosophy of management.” Assesses policies and cooperation among government and municipal departments.



## The Objective of Urban Forest Management

To optimize the leaf area of the entire urban forest by establishing and maintaining a canopy of genetically appropriate (adapted & diverse) trees and shrubs with minimum risk to the public and in a cost-effective manner.

- Dr. W. A. Kenney, University of Toronto



## Example Criteria and Indicators

| Criteria   | Performance Indicators                                   |   |   |  | Key Objective  |
|--|--|---|---|--|--|
|  | Low  | Moderate  | Good  | Optimal  |  |
| Relative Canopy Cover                              | The existing canopy cover equals 0-25% of the potential. | The existing canopy cover equals 25-50% of the potential. | The existing canopy cover equals 50-75% of the potential.   | The existing canopy cover equals 75-100% of the potential.   | Achieve climate- and region-appropriate degree of tree cover, community-wide.  |
| General awareness of trees as a community resource | Trees seen as a problem, a drain on budgets.             | Trees seen as important to the community.                 | Trees acknowledged as providing environmental, social and economic services.  | Urban forest recognized as vital to the communities environmental, social and economic well-being.                       | The general public understanding the role of the urban forest.   |
| Tree habitat suitability                           | Trees planted without consideration of site conditions.  | Tree species are considered in planting site selection.   | Community-wide guidelines are in place for the improvement of planting sites and the selection of suitable species. | All trees planted in sites with adequate soil quality and quantity, and growing space to achieve their genetic potential | All publicly-owned trees are planted in habitats which will maximize current and future benefits provided to the site. |

## The Approach

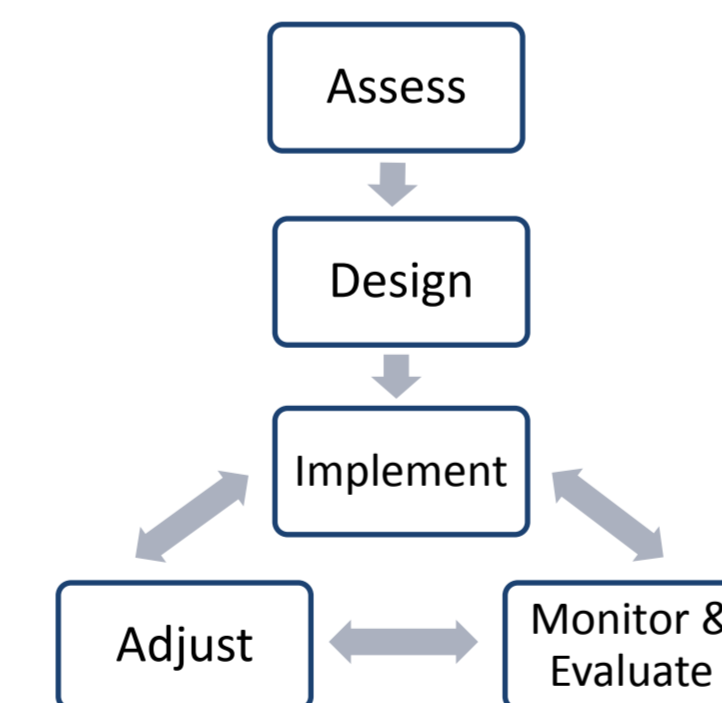
1. A model for strategic urban forest management planning.
2. Criteria and Indicators (C&I)
3. A Case Study – C&I in Urban Forest Management

### Management Planning is an 8-Step Process

1. Identification of urban forest attributes
2. Assessment of relevant resource data where it exists
3. Creation of vision reflecting community values
4. Determination of the current status of various components
5. Identifying gaps between vision and current status
6. Creation of administrative vehicle to close the gaps
7. Formulation of operational plan incorporating vision and goals
8. Implementation and monitoring of the plan

## Adaptive Management

The principle of accommodating changes and unforeseen events (e.g. drought, pests) without forcing changes to strategic goals and key objectives.



## C&I as Effective as Planning Tools

Kenney, van Wassenauer and Satel (in progress) developed additional and modified C&I to more easily quantify indicators of Urban Forest (UF) management success.

C&I were used in the development of a UF Management Plan for the Town of Oakville, Ontario. Firstly, they were implemented in a “gap analysis” to determine the state of urban forestry in the Town. They will also be used to track progress and implementation, and to develop the 2<sup>nd</sup> “5-Year Management Plan”.

## A Model for Urban Forest Management Planning

van Wassenauer, Schaeffer and Kenney (2000) proposed a conceptual model for urban forest management planning.

Came about in a response to the need for redefining urban forestry as more than just daily street tree management.

Combines the needs of growing urban centres with ecosystem viability and sustainability.

**Based on a 20-year planning horizon.**

## Criteria and Indicators (C&I)

**Criterion** – category of conditions by which sustainability can be assessed.

**Indicator** – qualitative or quantitative variable which can be measured and demonstrate trends. Measure of criterion.

C&I first proposed as a tool for urban forest management by Clark *et al.* (1997). 3 “types” of criteria.

## References

- Clark, J.R., Matheny, N.P, Cross, G., and V. Wake. 1997. A Model of Urban Forest Sustainability. Journal of Arboriculture 23(1).
- van Wassenauer, P.J.E, L. Schaeffer and W.A. Kenney. 2000. Strategic Planning in Urban Forestry: A 21<sup>st</sup> Century Paradigm Shift for Small Town Canada. The Forestry Chronicle 72(2).